

Name: Precision National Plating
ERS LOG #:

ATSDR Record of Activity

ROUTING:
J. Holler M Schwartz
ERS FILES

UID #: RAN2 Date: 06/23/2006 Time: 1400 am ☒ pm

Site Name: Precision National Plating City: Clarks Summit Cnty: Lackawanna State: PA

CERCLIS #: _____ Cost Recovery #: 305H Region: 03

Site Status (1) ☐ NPL ☒ Non-NPL ☐ RCRA ☐ Non-Site specific ☐ Federal
(2) ☐ Emergency Response ☒ Remedial ☒ Other: Enforcement

Activities

<input type="checkbox"/> Incoming Call	<input type="checkbox"/> Public Meeting*	<input checked="" type="checkbox"/> Health Consult*	<input type="checkbox"/> Site Visit*
<input type="checkbox"/> Outgoing Call	<input type="checkbox"/> Other Meeting	<input type="checkbox"/> Health Referral	<input type="checkbox"/> Info Provided
<input checked="" type="checkbox"/> Conference Call	<input checked="" type="checkbox"/> Data Review	<input type="checkbox"/> Written Response	<input type="checkbox"/> Training
<input checked="" type="checkbox"/> Incoming Mail	<input type="checkbox"/> Other :		

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Contacts and Affiliation

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1-EPA	2-USCG	3-OTHER FED	4-STATE ENV	5-STATE HLT
6-COUNTY HLTH	7-CITY HLTH	8-HOSPITAL	9-LAW ENFORCE	10-FIRE DEPT
11-POISON CTR	12-PRIV CITZ	13-OTHER	14-UNKNOWN	15-DOD
16-DOE	17-NOAA	18-OTHR STATE	19-OTHR COUNTY	20-OTHR CITY
21-INTL	22-CITZ GROUP	23-ELECT. OFF	24-PRIV. CO	25-NEWS MEDIA
26-ARMY	27-NAVY	28-AIR FORCE	29-DEF LOG AGCY	30-NRC
31-ATSDR				

Program Areas

<input type="checkbox"/> Health Assessment	<input type="checkbox"/> Health Studies	<input type="checkbox"/> Tox Info-profile	<input type="checkbox"/> Worker Hlth
<input type="checkbox"/> Petition Assessment	<input type="checkbox"/> Health Surveillnc	<input type="checkbox"/> Tox Info-Nonprofil	<input type="checkbox"/> Admin
<input type="checkbox"/> Emergency Response	<input type="checkbox"/> Disease Registry	<input type="checkbox"/> Subst-Spec Resch	<input type="checkbox"/> Other
<input checked="" type="checkbox"/> Health Consultation	<input type="checkbox"/> Exposr Registry	<input type="checkbox"/> Health Education	

Narrative Summary:

At 1549 on 6/21, ATSDR Region III emailed (see attached) ATSDR Emergency Response with a request from an EPA On-Scene Coordinator (OSC) for ambient air action levels for hydrogen sulfide (H2S) at an enforcement site in PA. ATSDR III had already contacted ATSDR V, who recently had been involved in a significant site involving H2S in homes and schools from a nearby landfill.

According to the background information provided, the PRP for this site intended to lower the concentration of hexavalent chromium in the soil on site by means of an in-situ chemical reduction to trivalent chromium using calcium polysulfide. The concept and process is described in the Source Area In-Situ Chemical Reduction Design Report dated November 3, 2005 and prepared by the RETEC Group. A resident affiliated with the community was concerned about the generation of hydrogen sulfide due to the chemical reaction, and the potential exposure of residents between a quarter- and a half-mile away. The OSC requested public health input from ATSDR on human health effect levels for H₂S in air relevant for community members. The OSC intends to implement perimeter and/or residential area air monitoring as part of the full-scale implementation of the remediation process at this site. The requested input from ATSDR would assist the OSC in interpreting air monitoring and air sampling results for H₂S at this site. On June 23rd at 1400, a conference call was convened between EPA III, ATSDR III, ATSDR V, and ATSDR DTEM to discuss the situation.

In the conference call, EPA summarized the site background and indicated that the in-situ remediation would take several weeks to complete. Monitoring in the boreholes during the test phase of the technology indicated the presence H₂S at the opening at concentrations of roughly 2 ppm in one reading, and below 1 ppm for the remaining readings (with a detection limit of the field instrument of ~ 1 ppm). The OSC requested input from ATSDR on human health effect levels for H₂S in air in order to develop an action level for comparison with ambient readings that will be collected at the site perimeter and/or in the residential area.

H₂S Toxicological Information

The reaction being proposed for the site involves injecting calcium polysulfide solution into the ground where chromate in the soil can react with it to produce less toxic chromium hydroxide. In addition to producing the hydroxide, this kind of reduction reaction would be expected to yield quite a bit of free sulfur. If carefully monitored and precisely done, no adverse health effects would be expected. However, precisely implementing a reduction reaction in the ambient environment can be a significant challenge. A slight change in environmental conditions may produce significant hazards at the scene. These hazards could include hydrogen sulfide and this flammable and toxic gas could move off-site.

Hydrogen sulfide (H₂S) is a flammable and colorless gas, which is heavier than air under standard conditions. The lower explosive limit for H₂S is about 4% by volume, which is roughly equivalent to a concentration of 40,000 ppm, and has an auto-ignition temperature of 260 C. This concentration or temperature are not likely to be produced under the conditions present or anticipated at this site. The gas has a characteristic odor of rotten eggs and is sometimes called sewer gas. Most people can detect the odor of H₂S at about 0.5 ppb, although some may smell it at lower or higher concentrations. According to some studies, the odors tend to become objectionable for most individuals at around 30 ppb. H₂S is a desensitizer, meaning that the ability to detect the odor of the gas is degraded by exposure to the gas. In other words, once exposed to the gas at one concentration, it takes a higher concentration for most humans to detect the presence of the gas when exposed a second time. H₂S occurs naturally and background levels range from less than 1 ppb up to more than 3 ppm; one joint study by ATSDR and EPA in 1999 reported peak levels in residential areas to be in the range of 30-50 ppb (ATSDR

Toxicological Profile, 2004). H₂S is highly irritating and can damage the respiratory tract, eyes, skin, and other normally moist parts of the body. At high concentrations, it can damage the respiratory system, cause loss of consciousness, and at very high concentration, death. Exposure to lower concentrations of hydrogen sulfide can result in neurological and less severe respiratory effects. Neurological effects include reduced coordination, poor memory, hallucinations, personality changes and loss of the sense of smell. Respiratory effects include nasal congestion, sore throat, cough, shortness of breath, or difficulty breathing. Impaired lung function may result. Individuals with pre-existing respiratory conditions like asthma may be more sensitive to the effects of H₂S than others.

ATSDR has established an acute (up to 14 days exposure) MRL of 0.2 ppm based on a human study involving the exposure of asthmatics to H₂S at concentration of 2 ppm and an intermediate (14 days to a year) MRL of 0.02 ppm based on a series of animal studies showing no adverse effects in the 20-30 ppm range (ATSDR Toxicological Profile, 2004). EPA developed a reference concentration based on the same animal study used by ATSDR in the development of the intermediate MRL; however, EPA adjusted for a chronic (over a year) setting and established the RfC at 2 ug/m³ or 1.5 ppb (EPA IRIS, 2003). These health guidance values represent levels that our respective agencies consider to be unlikely to cause adverse health effects in humans. Other comparison values include:

- Acute Exposure Guideline Levels (AEGL) developed by a multi-agency group (including EPA and ATSDR) for general population exposures up to a day;
- Emergency Response Planning Guides (ERPG) developed by the American Industrial Hygiene Association for general population exposures up to an hour;
- Recommended Exposure Limits (REL) developed by the National Institute for Occupational Safety and Health for healthy adult exposures up to 10 hours/day and 40 hours/week;
- Permissible Exposure Limits (PEL) established by the Occupational Safety and Health Administration for healthy adult exposures up to 8 hours/day, 40 hours/week; and,
- Threshold Limit Values (TLV) developed by the American Council of Government and Industrial Hygienist for healthy adult exposures up to 8 hours/day, 40 hours/week.

Based on the estimate that the remediation effort will take several weeks and the fact that the population in residential areas must be considered to be representative of the general population, these latter comparison values for short term exposures or for healthy adults are less appropriate for this setting.

Historically, at several sites under varying conditions, ATSDR has recommended an ambient air action level for the general population of 30 ppb. This concentration is two orders of magnitude below known health effects, approximates our intermediate MRL, at the low end of concentrations we might expect to see as a peak concentration in a residential area, and is near the level at which most people find the odor to be objectionable. Some individuals will still be able to detect the presence of the odor, but no adverse health effects would be expected including very likely those effects associated with any bad odor. By and large, this concentration has been successful in the past as an action level and ATSDR recommends its use in the residential areas for this site.

Action Required/Recommendations/Info Provided:

1. ATSDR recommends that roving real-time air monitoring be conducted during full scale implementation of the remedial action at this site at the perimeter and in the closest residential neighborhood. EPA may also want to consider air monitoring near downgradient seeps during the remedial action. EPA may also want to consider conducting baseline air monitoring for H₂S at the perimeter and in the closest residential neighborhood prior to initiation of the fullscale remediation action. The need for any laboratory quality samples to verify the real-time air monitoring results from the site should also be considered. ATSDR recommends that EPA consult with ERT or other appropriate experts regarding suitable monitors to achieve H₂S levels in the ppb range.
2. ATSDR recommends that, if the concentration detected by real-time air monitors in the residential areas near the site exceeds or equals 30 ppb during the remedial action, potential human exposures at that location should be evaluated in light of current conditions at the scene. Consideration should be given to implementing protective measures as appropriate. Protective measures may include reducing the emission rate of H₂S at the point source, implementing air plume suppression techniques at the site boundary, sheltering the individuals in place in the immediate area of the exceedance, or temporarily relocating the residents in that vicinity. Relocation should only be necessary in rare circumstances. ATSDR would be available to consult on appropriate protective measures before the implementation of those actions.

The recommendations and conclusions in this health consultation are based on the information available to ATSDR at this time. Additional information could alter the recommendations. ATSDR is available to the EPA OSC for further consultation as needed.

Signature: Richard A. Nickle Date: 06/28/2006

Enclosures: Yes (X) No (); MIS entered: Yes (X) No ()

cc: ATSDR Region
State HA Coop. Coord.
DHAC/PERIS
ERS Reading File